METHOD AND APPARATUS FOR FINDING OPTIMAL UNIFICATION SUBSTITUTION FOR FORMULAS IN TECHNOLOGY LIBRARY

ABSTRACT

The present invention is directed to a method and apparatus to find an optimal unification substitution for formulas in a technology library. In an exemplary aspect of the present invention, a method for finding an optimal unification substitution for formulas in a technology library during integrated circuit design may include the following steps: (a) receiving input including a list L of pairs of formulas in standard form, a set S of substitutions for variables, a right part $e(x_1, ..., x_p)$ of an identity, and an information $I = \{t, h, r, a, p\}$ on best application; (b) when the list L is not empty, extracting and removing first pair $(f'(A'_1, ..., A'_n), g'(B'_1, ..., B'_m))$ from the list L; (c) removing head inverters and buffers from formulas $f'(A'_1, ..., A'_n)$ and $g'(B'_1, ..., B'_m))$ and obtaining a pair $(f(A_1, ..., A_n), g(B_1, ..., B_m))$; (d) when the f is a commutative operation but neither a variable nor constant, and when heads of the formulas $f(A_1, ..., A_n)$ and $g(B_1, ..., B_m)$ are equal, searching for a basic argument A_j of the formula $f(A_1, ..., A_n)$; (e) when the basic argument A_j is found, letting P be head of said A_j and setting $i = 1$; (f) when head of B_i is equal to the P, making copy L' of the list L and making copy S' of the set S; and (g) forming a reduced pair (A', B') for pairs $(f(A_1, ..., A_n), f(B_1, ..., B_n))$ and (A_j, B_i) and adding the pairs (A_j, B_i) and (A', B') to the list L'.